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ABSTRACT

Two experiments compared cross-age and peer tutoring interventions within special education settings. In experiment 1, 47 elementary age learning and/or behaviorally disordered (LD/BD) students acted as tutors of younger LD and BD students. In experiment 2, 31 same-age LD and BD students alternated tutor and tutee roles. In both experiments, tutors and tutees exhibited academic gains. Only in experiment 1, however, were attitudinal gains observed. Findings suggested that both cross-age and peer tutoring represent effective and versatile interventions for special and remedial settings and both are positive alternatives to independent seat work or practice activities. (Author/CL)

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Tutoring Interventions Within Special Education Settings: A Comparison of Cross-Age and Peer Tutoring

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Abstract

In two experiments, cross-age and peer tutoring interventions conducted within special education settings were compared. In Experiment 1, learning disabled (LD) and behaviorally disordered (BD) students acted as tutors of younger LD and BD students. In Experiment 2, same-age LD and BD students alternated tutor and tutee roles. In both experiments, tutors and tutees exhibited academic gains. Only in Experiment 1, however, were attitudinal gains observed. Implications for future research and practice are given.

Tutoring Interventions Within Special Education Settings: A Comparison of Cross-Age and Peer Tutoring

Although the idea of enlisting the aid of students in the teaching process is not new (Allen, 1976a), research attention has recently been directed on the use of classroom peers as tutors (Cohen, Kulik, & Kulik, 1982). Such efforts are intended to increase the amount of individual instructional time students can receive, as well as to develop a sense of responsibility and self-confidence in the student designated as tutor (Allen, 1976b).

Within the last decade, the use of tutoring interventions involving special education students has been investigated (see Scruggs & Richter, in press; and Scruggs, Mastropieri, & Richter, in press, for reviews). Frequently, special education students have been employed as tutees in such interventions (e.g., Haisley, Tell, & Andrews, 1981; Jenkins, Mayhall, Peschka, & Jenkins, 1974; McCracken, 1979;Sindelar, 1982). In some investigations, however, special education students have been employed as the tutors of other special or remedial students (e.g., Dequin & Smith, 1980; Epstein, 1975; Higgins, 1982; Maher, 1982, 1984).

Tutoring interventions in special educational settings can take one of two basic configurations: cross-age tutoring and peer

tutoring. Cross-age tutoring, the most commonly selected intervention, has certain advantages over peer tutoring. A cross-age tutoring pair involves use of one student as "expert" of the content area and provides a focus of control in the tutoring dyad. Such a pair could be expected to function relatively independently.

The major concern of such cross-age tutoring centers upon potential benefits for the tutor, who is, after all, enrolled in school to learn and not necessarily to teach. A commonly heard response to the position is as Gerber and Kauffman (1981) concluded, "peer tutoring is a technique that may provide educational benefits to both the tutor and tutee" (p. 182). And, recently, Potential benefits to the mildly handicapped student as tutor have been investigated. Epstein (1975) employed learning disabled (LD) students as tutors of primary-aged LD students in reading. Epstein reported that the reading tutoring group performed significantly better than all control groups on a criterion measure of reading, but specific gains for tutors vs. tutees were not specified. Maher (1982, 1984), in two studies involving behaviorally disordered students as tutors of younger educably mentally retarded (EMR) students, maintained that the tutors had exhibited both social and academic benefits as a result of the intervention. Thus, there is at least some experimental support for the notion that tutors can benefit as well as tutees

from the intervention, although the amount of research literature generated to date can not be considered sufficient. In addition, a recent meta-analysis of tutoring effects concluded the commonly mentioned "self-esteem" benefits to tutors have not been documented (Cohen, Kulik, & Kulik, 1983). Krouse, Gerber, & Kauffman cautioned, "...Although it has been demonstrated that academic and social gains are frequently obtained by the tutor, this in itself is not sufficient justification for the child to be a tutor. Instead, it must be shown that by being a tutor specific needs are being met" (1981, p. 112).

Thus, it can be seen that use of older, mildly handicapped students as tutors can be an effective intervention, but may not be an intervention without certain drawbacks. First, use of remedial students as tutors may not always be the optimal use of the student's time, and benefits to students so employed have not always been realized (e.g., Gable & Kerr, 1980). Second, since resource rooms tend to schedule around ability groupings, scheduling of cross-age tutoring may present problems. A possible solution to these problems is to employ mildly handicapped as peer, or same-age (and ability), tutors of other mildly handicapped students. Such alternating tutors and tutees would thus both be working on ability-appropriate content, and scheduling would present fewer problems. And, indeed, there has been some recent support for this type of intervention. Higgins

(1982) employed LD students as alternating cross-age tutors in a within-subject design, and concluded that subjects, when tutoring, made greater gains than in a no-treatment control. These students gained equally well in a free-study condition, however, which raises the question of the relative ability of mildly handicapped students to effectively tutor age peers. In addition, it could be anticipated that same-age tutoring pairs may present more behavior management problems than cross-age pairing in which authority is clearly established.

It can be concluded, then, that both cross-age and peer tutoring are potentially valuable interventions which have received some support from the research literature. To date, however, the relative benefits of these two tutoring configurations have not been assessed within one study. That was the purpose of the present investigation, which, in two experiments, evaluated the effects of cross-age (Experiment 1), and peer (Experiment 2) tutoring, employing identical materials, procedures, and dependent measures, using two school districts in the same geographical area.

Choice of dependent measures and tutoring materials was based upon consideration of previous research findings (Scruggs, Mastropieri, & Richter, in press; Scruggs & Richter, in press). Reading was chosen as a content area because it has been seen that tutors can stand to benefit more in the type of fluency-building

activities that reading instruction provides (Scruggs, Mastropieri, & Richter, in press). Because structural interventions were more likely to produce gains, Harrison's Structured Tutoring (Harrison, 1976) materials were employed. Since self reported self-esteem measures have generally failed to document tutoring progress (Cohen, Kulik, & Kulik, 1983), an attitude toward school measure was employed which was thought to be more successful at documenting progress in tutoring interventions (e.g., Franca, 1983). Finally, to ensure consistancy of treatment across the 10 schools and two school districts who participated in this investigation, all tutoring sessions were directly supervised by project staff.

Experiment 1: Cross-Age Tutoring

Method

Subjects

Subjects for the larger experimental study were 47 elementary-age learning and/or behaviorally disordered students attending five different elementary schools in a western rural public school system. Participating teachers were asked to identify pairs of students who would be appropriate for cross-age tutoring interventions (i.e., for each pair, teachers were asked to select students who would get along well, read at a differing level with one student easily exhibiting mastery of content, and to select pairs of students who would not present substantial

scheduling difficulties). In this manner, a total of 27 learning disabled and behaviorally disordered children were identified for tutors and tutees in the experimental group. In addition, 20 children were selected for use as control students. These students were taken from identical settings in the identical schools and using the same resource and regular class teachers as those in the experimental schools, with the only exception being scheduling or matching difficulties preventing them from being easily integrated into the tutoring program. These 30 boys and 17 girls included 9 first grade students, 9 second grade students, 5 third grade students, 8 fourth grade students, 11 fifth grade students, and 5 sixth grade students. Average percentile reading level across all students as assessed by the Woodcock-Johnson Pretest was 23 (SD = 8.2). In addition, all students had been officially classified by the school district as learning disabled (N = 35) and behaviorally disordered (N = 12) according to Public Law 94-142 and local school district criteria, which, for the LD children, included a 40% discrepancy between achievement and ability.

Materials

Tutoring materials. Four books were compiled which were modified from the two beginning books by Harrison (1979). The first two books presented the content taught in Beginning Reading I, while the third and fourth tutoring boks represented the first and second half of Beginning Reading II.

Academic measures. The criterion tests from the Harrison materials were employed as pre- and postmeasures of correct reading skills being taught in the tutoring setting. In addition, the three reading subtests from the Woodcock-Johnson Psycho-Educational Battery were administered as pre-post measures of word attack, sight-word reading, and reading comprehension.

Attitude measures. The Attitute Toward School Measures developed by Mariscuilo and Levin (1968) were employed as measures of attitude change for the experimental study.

Procedure

The total tutoring intervention lasted 12 weeks, including one week of pretesting and tutoring instruction, ten weeks of direct tutoring, and one week of posttesting and feedback. First, all experimental and control students were administered all measures described above. Then, students identified as tutors were met with individually by project staff and introduced to the methods of structured tutoring:

1. Sit next to, rather than across from, the student you are tutoring.

2. Remember to give positive feedback and praise as often as possible, and never criticize or ridicule the other student's performance.

3. Be certain that the student has mastered the material in each step before proceeding to the next step.

4. When a student does make an error, correct him or her immediately and ask that the student read the word or words correctly immediately following the correction by the tutor.

In addition to the above four rules, students in this investigation were informed that some students may make progress slowly and that the tutor should be particularly certain to exhibit patience and not to expect the student to make strong gains in very short periods of time. The importance of the student's role as tutor was also emphasized to the student, and the importance of his role in making important changes in the tutee's academic functioning was also underlined.

After the basic rules for tutoring had been outlined to the student, the investigator and the student role-played a tutoring situation in which the investigator was the tutor and the student, the tutee. Following several minutes of this, in which the student declared that he understood the situation, the roles were reversed, and the student was asked to be the tutor. By this method, model for prompting, correcting, modeling, and praising student responses were given to the student and he/she immediately was able to practice them. Finally, when the student had exhibited to the satisfaction of the investigator competence as a tutor, he was asked to tutor with the tutee who was brought in to be tutored under the observation of the investigator. When it appeared that the tutor exhibited appropriate behaviors to the tutoring situation, the tutoring intervention was implemented.

It was not intended that even a one- or two-meeting orientation with supervised practice would be sufficient to teach all there was to learn about tutoring. It was felt, however, that the best exercise was tutoring itself. Therefore, the tutoring started soon after general instruction with the assumption that corrective feedback along the way on the part of project personnel in the best practices of tutoring would be most helpful. Although the amount of time spent for tutoring sessions were made similar across the district at 30 minutes per session, the number of sessions per week varied considerably. Therefore, 6 experimental students were involved in tutoring interventions five days a week. Two were involved four days a week, and 19 were involved in tutoring two or three days a week. These tutoring sessions occurred during the spring semester of the school year, and each session was directly supervised by project staff who, without actually delivering reading lessons or content, were available when students had questions about a word or were available to deliver corrective feedback on tutoring procedures. At the end of 120 weeks of direct tutoring sessions, students were met with individually and given all posttest measures.

Results

Results on academic measures. On the criterion test, percentage of words correctly read was computed on pre- and posttest scores. The pretest score was subtracted from the

posttest score and a new variable, gain score on the diagnostic measure, was developed. On this measure, gains of the tutees (21%) was double that of the control students (10%). These differences were statistically significant ($p < .05$). The gain score of the tutors made on this diagnostic instrument, however, was only 8%, comparable to that of the control students. In addition, the raw gain score exhibited by tutors and tutees on the Woodcock-Johnson Word-attack subtest (means of 2.75 versus 2.83 respectively) was substantially higher than the mean gain of control students (.65). Tutors and tutees both exhibited significant gains on the Word-attack subtest ($t[25] = 3.16$, $p < .004$), with tutors independently exhibiting significant gains ($t[11] = 3.11$, $p < .008$). By contrast, control students did not exhibit significant gains ($t[18] = .78$, $p < .44$). Significant differences for tutees, tutors, or control students were not observed on word reading, reading comprehension, or total reading subscores of the Woodcock-Johnson (all $|t|s < 1$).

Results on the social measures. On the attitude instrument, tutees were seen to gain significantly more than the control group with mean gain scores of 2.69 versus .00, respectively. This seems to indicate a significant differential gain on the part of tutees. The attitude gain was statistically significant ($t[14] = 2.08$, $p < .05$) on the part of the tutees, and significant on the part of controls (all $|t|s < 1$).

Discussion

In summary, the information gain on the criterion tests, the norm-referenced academic tests, and the attitude measures indicate that cross-age tutoring is a potentially productive and effective intervention which can be implemented in special education classrooms with relatively little difficulty. It was seen that tutees gained substantially more than tutors on the criterion test, although the tutors did not differ from control students on the whole. The exception to this was the differentially superior performance of the tutors on the Woodcock-Johnson Word-attack subtest. Because of the highly differential amount of corrective feedback on decoding skills, they were required to tutor students several times a week for a period of over 10 weeks.

The significant gains in the diagnostic instrument on the part of the tutees indicate that handicapped students can, in fact, be quite potent as tutors of other handicapped students and that the net result of this tutoring may be to take a substantial amount of pressure off the resource or special class teacher. One interpretive difficulty involved in this experiment was that, in fact, it was project staff and not resource teachers who were actively monitoring the tutoring project. The extent to which teachers themselves could, in fact, monitor these pairs and conduct their own instruction was not determined through the present investigation, although informally teachers expressed no

concern that this could be done and, in fact, on several occasions, when project staff were not available for supervision, did take over this responsibility with no apparent difficulty. In addition, the scheduling difficulties which were foreseen as causing problems with cross-age tutoring were not appreciably realized, and those difficulties which did occur were overcome relatively easily. The result of these findings indicates then that resource and self-contained special education teachers would benefit well from interventions in which some of their handicapped students served as tutors for students who were less high functioning. Although the academic benefits to these tutors were less prominent than they were to the tutees, they were nonetheless tangible. It is also possible that tutors themselves could be utilized as tutees in other investigations to help give them added additional individualized instruction.

The finding of significant gains in attitudes on the part of tutees, but not tutors, came as somewhat of a surprise to the investigators, particularly in light of the commonly expressed notion (Allen, 1976b) that tutors would be the individual expected to gain most in affective areas. Strodtbeck, Ronchi, and Hansell (1976), however, provide a rationale for the observed differences in attitudes of the tutees. These authors suggest that a student who is employed as a tutee which involved a tutor to whom that student looks up may, in fact, feel more positive towards him/

herself because of the positive attention he/she receives from the older tutor. In other words, a student may feel that since he/she receives this positive tutoring support, he/she may be more subject to positive self-attitudes.

It was seen then, that both tutors and tutees exhibited gains not observed in the control group in reading skills, and tutees experienced positive gains in attitudes toward school. Tutors in Experiment 1, however, did not exhibit either gains in attitudes or gains on the reading criterion measure. The lack of improvement on the criterion test may be attributable to the fact that students were tutoring skills they had already mastered.

Experiment 2 was designed to determine whether similar effects would be realized if students employed as peer tutors were used.

Experiment 2

Subjects

Subjects for Experiment 2 were 31 elementary-age learning and/or behaviorally disordered students attending 5 different elementary schools in a western rural public school system adjacent to that in Experiment 1. Participating teachers were asked to identify pairs of students who would be appropriate for peer tutoring intervention (i.e., for each pair, teachers were asked to select students who would get along well, read at about the same level while being in the same grade level, and pairs of

students who would not present substantial scheduling difficulties). In this manner, a total of 16 learning disabled (N = 12) and behaviorally disordered (N = 4) children were identified for tutors and tutees in the experimental group. In addition, 15 children were selected for use as control students. These students were taken from the same settings, same schools, and same teachers as the experimental students, with the only exception being either scheduling or matching difficulties preventing them from easily being integrated into the tutoring program. This sample of 31 elementary-age students included 11 second-grade students, 8 third-grade students, 5 fourth-grade students, and 7 fifth-grade students. Average reading percentile assessed by the Woodcock-Johnson pretest was 19 (SD = 7.6). In addition, all students had been officially classified by the school district as learning disabled (N = 24) and behaviorally disordered (N = 7) according to Public Law 94-142 and local school district criteria.

Materials

Materials and dependent measures were the same as those used in Experiment 1.

Procedure

The total peer tutoring intervention lasted on the average 10 weeks, including one week of pretesting and tutoring instructions, eight weeks of direct tutoring, and one week of posttesting and

feedback. Training and tutoring procedures were the same as those in Experiment 1 with the exception that students were told to alternate tutor and tutee roles once every session.

Although the amount of time spent for most tutoring sessions remained the same across the district at 30 minutes per session, the number of sessions per week varied considerably. Therefore, six experimental students were involved in tutoring intervention five days a week, four experimental students were involved in tutoring four days a week, and six experimental students were involved in tutoring only two days a week. The tutoring occurred during the spring semester of the school year, and each session was directly supervised by project staff who, without actually delivering the lessons, were available when students had questions about a word or to deliver corrective feedback on tutoring procedures. At the end of the eight weeks of direct tutoring sessions, students were met with individually, given all posttest measures, and given feedback on the tutoring project.

Results

Results on academic measures. On the criterion test, percentage of words correctly read was computed on pre- and posttest scores. The pretest score was subtracted from the posttest score, and a new variable, gain score on a diagnostic measure, was developed. According to this measure, students in the experimental group gained an average of nearly 15% on the

diagnostic measure (SD = .12), while the control group gained virtually none (3%, SD = .06). These differences in gain scores were highly significant, $p < .003$. In addition, the experimental group gained 2.1 words on the Word-attack subtest of the Woodcock-Johnson, while the control group gained only 1.2 during the same time period. This increase was highly statistically significant for the experimental group ($t[14] = 2.87$, $p < .01$), but only approached significance for the control group ($t[13] = 1.96$, $p < .07$).

Social measures. Effects of tutoring on student attitude were nonsignificant, with students in both experimental and control groups reporting highly positive attitudes in personal, school, and reading areas.

Discussion

Information from the individual progress charts, as well as the strong pre-post differences on the criterion measure and the significant gains in Word-attack on the Woodcock-Johnson, strongly suggest that learning disabled and behaviorally disordered students are able to teach each other in peer tutoring settings and learn critical reading skills via this type of structured tutoring. The gain scores were considered to be particularly strong, considering several of the tutor pairs were not involved as often as the project thought optimal. It must also be mentioned that the students involved in peer tutoring were not

taken away from their regular resource room or self-contained direct instructional time, but were involved in instructional activities supplementary to the reading programs they were already receiving. Since scheduling these pairs of students across a wide variety of settings was a complex task, it is not possible to specify exactly the activities of the control students. Indeed, this would be impossible to assess as experimental students tutoring was undertaken as differing times from early in the morning until late in the afternoon, depending upon the school and the tutoring pair. It was known, however, that control students received an equal amount of time in resource and self-contained settings and that it is highly unlikely that tutoring students received any additional allocated time for the task of reading. In fact, the control activities most commonly replaced by the tutoring intervention were individual seatwork or teacher-led instruction. To this extent, then, it can be seen that the tutoring gains were quite strong and represented a positive alternative to alternate activites of special education students when not engaged directly by the teacher in one-to-one teaching or small-group instruction. This information is considered to be of substantial interest, because commonly, teachers in resource or self-contained settings do not have time or scheduling convenience to be completely on-task with all students at all times. This type of peer tutoring, then, apparently can meet the needs of

teachers to (a) provide students with additional practice activities in a structured setting, and (b) provide a method for monitoring their activities without being in direct contact with them.

One difficulty in interpreting the present results as completely generalizable was the fact that project personnel from outside the classroom supervised the tutoring, rather than the teacher. This was done for two reasons: First, to provide additional assistance to teachers whose schedules were already demanding; and second, to monitor the tutoring sessions in a fashion which will be consistent across the many different school settings utilized by the investigators. To this extent, and particularly in the school in which only one pair of students may have been involved in tutoring at one time, the supervision may have been more intense than could be reasonably expected were these interventions applied directly in special education settings. It was demonstrated in the study, however, that one individual who could have been a teacher's aide, could monitor as many as three pairs of students at one time, and that monitoring even one pair of students could provide those students an opportunity to practice positive social responses in addition to the regular reading skills. It must also be mentioned that in an informal sense, much off-task behavior was observed in several tutoring pairs, particularly ones below fourth-grade level, and

that the level of social maturity necessary for effective tutoring performance is something which needs to be investigated by researchers and individual teachers in designing and implementing these tutoring programs. However, it was observed that although in some settings, on-task behavior and appropriate responses were less than might have been considered optimally desirable, an examination of individual progress charts indicates that virtually all students, in fact, gained reading competence from the intervention. This assertion is also supported by the fact that all students indicated gain on the pre and post measures.

The fact that experimental group students did not improve in reported attitudes toward school, may be a result of an intervention in which neither student is clearly "in charge," and both students were of simiar age and ability levels. To this extent, then, attitudes may not have improved.

General Discussion

Both cross-age and peer tutoring interventions were seen to produce positive results. Students employed as cross-age tutors gained general decoding skills, but did not gain in skills which were a direct component of the tutoring activities. In contrast, peer tutors and tutees gained in both specific and general reading skills in contrast to control students. Attitude gains were observed only in the cross-age configuration, suggesting that cross-age tutoring may hold more potential for social gains. This

finding is supported by the work of Maher (1982, 1984), although in those investigations, benefits were seen to accrue to the tutors, rather than the tutees of the present investigation.

Further research is needed to further examine the relative benefits of cross-age vs. peer tutoring; and, in fact, the present authors are currently engaged in such activity (Osguthorpe, Scruggs, & White, 1984). At present, however, it can be stated that both cross-age and peer tutoring represent effective and versatile interventions for special and remedial settings, and certainly appear to be positive alternatives to independent seat work or practice activites. Before initiating such interventions, however, it is important that teachers clearly specify objectives, carefully structure the tutoring sessions, provide regular feedback, and monitor progress on toward the completion of objectives. Through these means, teachers can ensure that a tutoring program can be a positive experience for all students involved.

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